

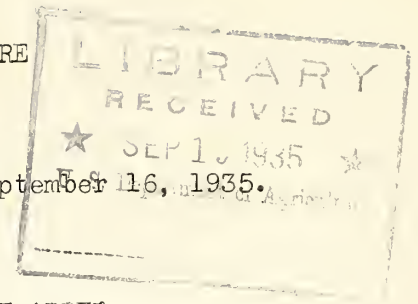
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UNITED STATES DEPARTMENT OF AGRICULTURE
Weather Bureau
Washington

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CIRCULAR

POTENTIAL TEMPERATURE AND MIXING RATIO TO BE ADDED
TO AIRPLANE WEATHER OBSERVATION REPORTS

Beginning October 15, 1935, the potential temperature and mixing ratio for each significant level will be transmitted in the daily teletype reports.

The potential temperature will be indicated to the nearest whole absolute degree ($^{\circ}\text{C.}+273$) and will follow the relative humidity in the message.

The mixing ratio will follow the potential temperature in the message and will be obtained to one decimal place in grams of water vapor per kilogram of dry air. However, the decimal point will be omitted from the teletype report, the last figures always being deciphered as tenths, i. e., of the unit, g./kg. When the figure to the right of the decimal point is zero, a cipher will be transmitted, e. g., 16.0 will be transmitted 160. When the computed value is less than 1.0, e. g., 0.7, the zero to the left of the decimal point will be transmitted 07.

Following are some examples and the corresponding data to be transmitted:

Potential temperature $^{\circ}\text{A.}$	Computed values of mixing ratio g./kg.	<u>Transmitted by teletype or radio</u>	
		<u>Potential temperature 1/</u>	<u>Mixing ratio</u>
240	0.7	40	07
267	1.4	67	14
273	3.0	73	30
306	20.7	06	207
325	6.9	25	69

1/ (First and last examples represent the approximate extremes of potential temperature;) the omission of the figure 2 or 3 in the transmission should therefore not be confusing.

Stations telegraphing their APOBS in word code will indicate the potential temperatures and mixing ratios by two words, following the Temperature-Humidity word, for each significant level taken from the "Pressure-Temperature" words, pp. 19-28, Weather Code 1931. The first of these words will indicate the potential temperature as shown in the following examples: 241°A.; double the digit 24 and indicate 48 in the first code element; indicate the digit 1 in the second code element. Thus the code word GOODBYE will indicate 241°A. Similarly, 266°A. will be indicated by MANUAL; 293°A., MOURNFUL; 310°A., NAIL; 335°A., NISMUR, etc.

The second word will indicate the mixing ratio as shown in the following examples:

16.9 g./kg.; double the digits 16 and indicate 32 in the first code element; indicate the digit 9 in the second code element. Thus the code word FATTY will indicate 16.9 g./kg. Similarly, 23.2 g./kg. will be indicated by GIDDY; 9.3 g./kg., BOASTFUL; 0.8 g./kg., USURP; 0.1 g./kg., UNBUCKLE, etc.

Circular dated December 1, 1934, Instructions for Daily Transmission of Airplane Weather Observations, is amended accordingly.

Instructions for obtaining potential temperatures and mixing ratios for inclusion in the daily transmissions of APOBS are being furnished the stations where airplane observations are made.

C. C. Clark,
Acting Chief of Bureau.